City of FRESNO

Intelligent Transportation Systems Management Plan

Traffic Engineering

PUBLIC WORKS DEPARTMENT

CITY OF FRESNO

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Index

Executive Summary

Generally, the increasing costs, community issues, and environmental considerations involved in funding and constructing traditional roadway and other transportation infrastructure projects mean that it is no longer possible to build a way out of transportation problems. In order to deal with the situation, intelligent transportation systems have evolved, providing a new option for improving the efficiency of the existing and planned transportation network.

The Intelligent Transportation Vision for San Joaquin Valley (Regional Plan) is to enhance the quality of life, mobility, and the environment through coordination, communication and the integration of ITS technologies into the valley's transportation systems. The SJV Regional Plan identifies a 20-year strategy, and also includes a detailed, short-term component identifying specific priority projects for implementation for Fresno County 1) Fresno/Clovis Regional ATMS Completion Project, 2) Fresno/Clovis area Signal Coordination, 3) FAX Fare Equipment Deployment and Transit Management Systems Expansion *(San Joaquin Valley ITS Strategic Deployment Plan, 2001: Priority Project in Fresno County).*

The Intelligent Transportation System Vision for Fresno County is to enhance safety, mobility, efficiency, and transportation productivity, and to improve the quality of life and environment through the use of cost effective ITS technologies and systems. The City of Fresno has committed to fulfill a leadership role in the development of a Fresno-Clovis Metropolitan Region Traffic Coordination System. The Plan covers a 20 year time span and serves as a starting point for the deployment of improved transportation management systems in the region (*Fresno County Strategic Deployment Plan, 1999: Executive Summary*).

The Intelligent Transportation Systems Mission for City of Fresno is to implement an Advanced Transportation Management System that will improve safety, mobility, efficiency, transportation productivity, and quality of life and environment in the greater Fresno metropolitan area in a manner consistence with the Fresno City-Wide Traffic Signal Control System Master Plan, Fresno County ITS Strategic Deployment Plan, San Joaquin Valley Regional ITS Plan, the Regional Transportation Plan. The ITS Program Mission supports the City's 2025 General Plan transportation objectives through the application of technologies that focus on addressing transportation problems by improving the existing transportation infrastructure.

In 1995, the City of Fresno embarked on a goal to build a Traffic Operations Center and a city wide fiber optic network that would interconnect City of Fresno, City of Clovis, County, Council of Governments, and Caltrans District 6, providing the foundation for a coordinated traffic management system. The Advanced Traffic Management System (ATMS) will connect the Traffic Operations Center to a fiber network, connecting key arterials and expressways for an efficient citywide traffic coordination system. The network of controllers, cameras and radar systems will relay "real time" traffic or accident information to Transportation, Transit, Fire, and Emergency Services that will assess the incident and dispatch the appropriate services.

The City of Fresno's ITS Phases 1 and 2 constructed the Traffic Operations Center and 55 miles of transportation infrastructure. In 2007, ITS Phase 3 project completed building the Advanced Transportation Management System, interconnecting approximately 65 traffic signals for key arterials of Blackstone, Herndon, Willow, Chestnut, Kings Canyon and parts of Downtown Fresno. The City's Traffic Engineers now have a state-of-the-art technology to monitor, model, and coordinate traffic on some of the City's major arterials, thereby, improving safety, operations, energy conservation, and effective capacity of major arterials.

The City's commitment to the Region's, County's, and City's Intelligent Transportation Systems Vision, Mission and Goals have developed into the City's ITS Operations & Maintenance, Standards, and Capital Programs.

- ☑ Operations and Maintenance Program is funded with approximately $700,000 annual budget and is staffed with 7 permanent positions.
- ☑ Blackstone and Herndon Avenues are synchronized with models indicating travel time reductions of up to 18%, fuel savings of 1.35 million gallons annually, and emission reductions of (CO) 300 Metric Tons, (NOx) 60 MT, (VOC) 75 MT. In 2009, Chestnut Ave, Cedar Ave, and Kings Canyon Road were synchronized and efforts are underway to re-synchronize Herndon Ave.
- ☑ ITS Standards and Specifications are published after extensive research and development (*City of Fresno, ITS Standards & Specifications, 2008 and Wireless ITS Standards & Specifications, 2009).* All traffic signal projects now include Intelligent Transportation Systems per City ITS Standards.
- ☑ Traffic Signal Mitigation Impact Fee Program will provide $23 million of developer fees or developer constructed ITS facilities as the City's General Plan is built out (City of Fresno, Bill B-48, Ordinance 2007-50, 2007: Article 4.11). All developer projects are conditioned to include Intelligent Transportation Systems per City ITS Standards.
- ☑ The ITS Program fosters local partnerships through mutually beneficial and shared resources. In 2003, ITS Program Staff worked with Clovis Unified School District to manage a conduit and fiber project that provided fiber connectivity between CUSD Office and Schools. In 2008, staff have negotiated an addendum to the contract expanding the agreement to provide conduit and fiber connectivity to the new State Center Community Campus.
- ☑ The ITS Program has partnered with Caltrans District 6, providing fiber connectivity to Highway 41 ramps through the Blackstone corridor segment of the fiber network. ITS Program Staff are working with Caltrans Dist. 6 Staff towards a mutually beneficial shared fiber network agreement.
- ☑ In 2006, Congestion Mitigation and Air Quality Program (CMAQ) awarded the ITS Program with $4.2 million for Intelligent Transportation Systems (ITS) deployment on Shaw Ave from SR 99 to Highway 41.
- ☑ In 2008, Proposition 1B Traffic Light Synchronization Program Grant awarded the ITS Program with $2.1 million and CMAQ Lifeline allocated $1 million, totaling $3.1 million for ITS deployment on Shaw Ave from Highway 41 to Highway 168.
- ☑ In 2008, Proposition 1B Traffic Light Synchronization Program Grants awarded the ITS Program with $2.1 million for ITS deployment on Clovis Ave from Dakota to Jensen Ave. Also, CMAQ Program Grants awarded the ITS Program with an additional $1 million for ITS deployment on Clovis Ave, expanding the synchronization to American Ave.
- ☑ In 2008, CMAQ Program Grants awarded the ITS Program with $1.4 million for ITS deployment on Willow Ave from Ashlan Ave to International Ave. Similarly, the CMAQ Program Grants awarded the ITS Program $220,000 for wireless ITS deployment along Fresno Street from Olive Ave. to Herndon Ave.
- ☑ In 2009, Congestion Mitigation and Air Quality Program Grants awarded the Public Works Department ITS Program with $5.8 million for Wireless Intelligent Transportation Systems deployment on Nees Ave, Bullard Ave, Ashlan Ave, Shields Ave, McKinley Ave, Tulare Street, West Ave, and First Street.
- ☑ Overall, the ITS Program has secured $18 million in traffic synchronization and air quality grants to construct and synchronize 12 additional Intelligent Transportation Systems corridors, thereby, synchronizing two thirds (331 of 500) of City's traffic signals by 2015.

San Joaquin Valley ITS Strategic Deployment Plan
Priority Projects & Opportunities

> "*The Intelligent Transportation Vision for San Joaquin Valley (SJV) is to enhance the quality of life, mobility, and the environment through coordination, communication and the integration of ITS technologies into the valley's transportation systems" (San Joaquin Valley ITS Strategic Deployment Plan, 2001).*

The eight counties of the San Joaquin Valley: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare oversaw the preparation of a "blueprint" to guide the implementation of Intelligent Transportation Systems (ITS). The Intelligent Transportation System Strategic Deployment Plan (SDP) for the San Joaquin Valley Region is a 20-month study jointly funded by California Department of Transportation (Caltrans) and the individual counties with San Joaquin Council of Governments (SJCOG) serving as project administrator. The San Joaquin Valley region represents one of the last geographic areas in California to develop an ITS Plan. Two ITS Strategic Plans have been completed for portions of the San Joaquin Valley: Fresno County (1999) and Kern County (1997). The San Joaquin Valley ITS Strategic Deployment Plan will reference and build upon these plans. The San Joaquin Valley plan will also reference, and as appropriate coordinate with, several other plans, including: Central Coast ITS Strategic Deployment Plan, Sacramento Area EDP, San Francisco Bay Area EDP, Sierra Nevada SDP, and the LA/Ventura SDP.

ITS technologies refer to a wide variety of tools and techniques that focus on addressing transportation problems by improving the efficiency and safety of the existing transportation infrastructure through the application of communications, computing, information and other "high level technologies." They include more immediately recognizable features such as: emergency call boxes, changeable message signs, signal synchronization and preemption, and Highway Advisory Radio; and also more advanced technologies including Traffic Operations Centers, Automatic Vehicle Location devices, information kiosks, and electronic payment services for transit and tolls.

The San Joaquin Valley ITS Strategic Deployment Plan identifies a 20-year strategy, and also includes a detailed, short-term component identifying specific priority projects for implementation in the first few years. The Plan includes recommendations for valley-wide and inter-jurisdictional initiatives to address problems that affect the entire region, as well as recommendations for specific priority projects and opportunities that will address specific problems *(SJV ITS SDP, 2001: Page 1-1*).

Priority Projects in Fresno County

- Fresno/Clovis Regional ATMS Completion Project, Phase 3.
- Fresno/Clovis area Signal Coordination.
- FAX Fare Equipment Deployment & Transit Management Systems Expansion *(SJV ITS SDP, 2001: Page E-16, E3.2).*

Fresno County Opportunities

- Maintain momentum generated by recent ITS strategic deployment planning process, taking advantage of the level of awareness and precedent for joint action established through the previous planning efforts.

- Continue efforts to improve coordination between the Caltrans District 6 and Fresno metro area traffic management centers, taking advantage of the current District 6 and Fresno fiber optic implementation projects. Utilize the Fresno-District 6 coordination efforts as a demonstration of the benefits of improved coordination between Caltrans and local traffic management centers.

- Other local entities (in addition to City of Fresno) investigate opportunities to coordinate with Caltrans District 6 fiber optic system with City of Clovis and County of Fresno.

- Support and expand upon the projects identified in the Fresno County ITS Strategic Deployment Plan that are intended to develop a regional transportation user information system, connections to a valley wide or statewide information system, and development of common or standard electronic maps to support applications such as automatic vehicle location (SJV ITS SDP, 2001: Page 3-7, Par 3.3.1).

Regional Transportation Plan
ITS Strategic Deployment Planning

The Regional Transportation Plan is a long-range plan that provides a blueprint for future transportation improvements and investments based on specific transportation goals, objectives, policies and strategies. The purpose of the Regional Transportation Plan is to provide strategic direction for transportation capital investments by assessing regional growth and economic trends. Thus, the Regional Transportation Plan helps planners link transportation investments to provide a cohesive, balanced and multimodal transportation system that will help relieve traffic congestion *(Council of Fresno County Governments, 2008: Web-page Summary).*

The Needs Assessment of the Regional Transportation Plan establishes a plan for addressing identified needs and issues consistent with the goals, policies, and objectives stated in the plan. The Highway, Streets, and Roads Section provides an excellent summary of the County's Intelligent Transportation Systems Strategic Deployment Planning as outlined below *(Regional Transportation Plan, 2007: Chapter 4.3).*

Intelligent Transportation Systems Strategic Deployment Planning:

In September of 1999, the Council of Fresno County Governments Policy Board adopted the Fresno County Intelligent Transportation System (ITS) Strategic Deployment Plan (SDP). The plan was funded by a federal planning grant and is intended to provide a framework for the planning, programming, and deployment of advanced transportation systems for Fresno County over the next twenty years. The ITS SDP represents a comprehensive effort to build consensus on the application of advanced technologies to allow public agencies to better manage the existing transportation system.

> *"The Intelligent Transportation System Vision for Fresno County is to enhance safety, mobility, efficiency, and transportation productivity, and to improve the quality of life and environment through the use of cost effective ITS technologies and systems" (Fresno County ITS Strategic Deployment Plan, 1999).*

In Fall 2006, staff from the eight Valley COGs met to review the status of the ITS SDP to determine if an update was justified. After a review of ITS projects within Fresno County, Kern County, Kings County, Tulare County, Madera County, Stanislaus County, San Joaquin County and Merced County, staff from the eight Valley COGs unanimously concluded that an update was not necessary, as no new projects had been completed since the approval of the ITS SDP in 1999. This recommendation was forwarded to the eight Valley COG Directors in January of 2007, where the recommendation not to update the ITS SDP was accepted.

Over the past decade, ITS has become a recognized tool for improving the operation and efficiency of the transportation system. Individual agencies in the Fresno County Region have already undertaken several ITS deployment efforts ranging from traffic signal system improvements to transit management systems and from enhanced emergency service Computer Aided Dispatch to freeway surveillance projects. However, these projects have largely been independent efforts focused on improving the capabilities of a single agency without major consideration for larger regional needs and issues.

The development of the Fresno County ITS Plan followed the required federal ITS planning process. As the lead agency, the Council of Fresno County Governments initiated the creation of an ITS Subcommittee to provide input into and oversee the development of the ITS Plan. This Subcommittee included representatives from all Fresno COG member agencies, as well as the Federal Highway Administration (FHWA), Caltrans Headquarters, and the private sector. Within this Subcommittee several meetings were held that separated representatives into their specific areas of interest (traffic systems, incident management, transit, etc.) in order to provide for more focused input at key points in development of the Plan. In general, the development of the SDP followed a combined planning and broad level systems engineering approach. This approach included:

- Identification of problems and needs.
- Definition of an ITS vision and goals for the region.
- Selection of a preliminary set of ITS functions or capabilities (known as "market packages" in the national architecture) along with the development of a series of preliminary project concepts.

- Development of regional system architecture based on national and statewide ITS architecture efforts.

- Refinement of the project concepts, in combination with the market packages and system architecture, into a set of refined project descriptions including preliminary timelines, cost estimates, and deployment concepts.

- Identification of potential funding approaches and opportunities.

- Development of a series of suggested policies and an institutional structure to support ITS deployment in the region.

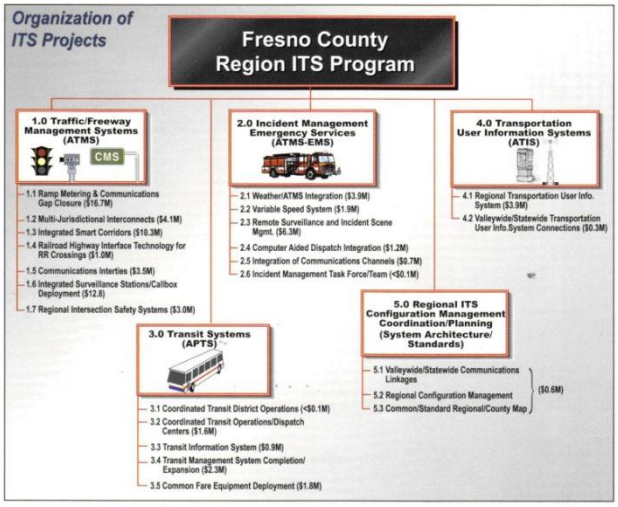
In order to assess the types of ITS projects best suited to Fresno County, the ITS Subcommittee identified the priority transportation problems and ITS user needs. This identification occurred through responses to surveys and a series of workshops and meetings. The following chart identifies the priority problems identified by the Subcommittee. The problems were ranked based on scoring criteria applied by transportation stakeholders in a series of exercises.

Exhibit 4-8
Priority Transportation Problems and ITS User Needs

Rank	Priority Problem	Score
1	Lack of Integration/Coordination/Common Communications	33
2	Signal Coordination (Needed)	22
3	Emergency Response Time	19
4	Air Quality	18
5	Funding	15
6	Lack of Traveler Information	12
7	Staffing	9
8	Red Light Running	7
9	GIS Mapping/Mapping Standards/Old Maps	5
10	Visibility Related Incidents (Fog/Dust)	3
11	Lack of Surveillance	2
12	Data Needs (for transportation planning & evaluation purposes)	1
13	Incidents (General)	1
14	Lack of Known Standards	1

Once the priority problems were identified, the Steering Committee identified a number of projects to address those problems. For the purpose of the Fresno County ITS Strategic Plan, ITS projects have been categorized into five major areas known as program areas. These areas and the projects identified within them include:

1. Traffic/Freeway Management Systems Program Area



These projects focus on improving traffic and safety, as well as reducing delays along freeways and arterials. ITS projects have had considerable success in this area. The cities of Fresno and Clovis, as well as Fresno County, are deploying enhanced signal and traffic management capabilities to reduce travel times and better manage congestion. The projects identified within this category include:

- Ramp Metering & Communications Gap Closure - Deployment of additional ramp metering and freeway management capabilities within the region, including an interim solution for the Caltrans Automated Traffic Management Systems (ATMS) software.

- Multi-jurisdictional Interconnects - Deployment of the communications and enhanced signal systems necessary to further improve inter-jurisdictional signal coordination.

- Integrated Smart Corridors - Deployment of enhanced surveillance and management systems along SR 41/168/180 to better manage traffic conditions and incidents.

- Railroad Highway Interface Technology for RR Crossings - Deploy equipment to increase safety and provide delay information to motorists at key crossing locations.

- Communications Interties - Provides for the communications and systems necessary to allow enhanced interagency communications, sharing of resources and information, and development of a Regional Integrated Workstation (RIW).

- Integrated Surveillance Stations/Callbox Deployment - Deploys remote surveillance equipment to provide incident detection and field device support in outlying areas of the region. Also includes establishment of a regional motorist-aid system.

- Regional Intersection Safety Systems - Deploys equipment at high incident intersections to enhance the safety of motorists and pedestrians though increased visibility and automated red-light enforcement.

- Incident Management/Emergency Services - Focuses on saving lives through decreasing incident response and clearance times. Several emergency service agencies in the Region have deployed improved computer aided dispatch and fleet management systems to improve incident coordination and response. Identified projects include:

    - Weather/ATMS Integration
    - Variable Speed System
    - Remote Surveillance and Incident Scene Management
    - Computer Aided Dispatch Integration

- Integration and Communications Channels
- Incident Management Task Force

2. Transit Systems Program Areas

The Fresno Region is already realizing the benefits from Fresno Area Express' ITS transit management system. The Strategic Plan focuses on improving transit coordination and real–time information provided to transit patrons. FAX uses information from their system to make decisions on service options, as well as to improve day to day service.

- Coordinated Transit District Operations
- Coordinated Transit Operations/Dispatch Centers
- Transit Information System
- Transit Management System Completion/Expansion
- Common Fare Equipment Deployment

3. Transportation User Information Systems

Focuses on providing improved real-time transportation information to the traveling public. This information is useful to commuters as well as tourists, allowing them to make informed travel decisions. So far the Region has deployed some simple information systems that the public relies upon everyday.

- Regional Transportation User Information System
- Valleywide/Statewide Transportation User Information System Connections

4. Regional ITS Configuration Management Coordination/Planning Program Area

These projects provide for the overall coordination and integration of the ITS deployment effort in the Fresno County region.

- Valleywide/Statewide Communications Linkages
- Regional Configuration Management
- Common/Standard Regional/County Map

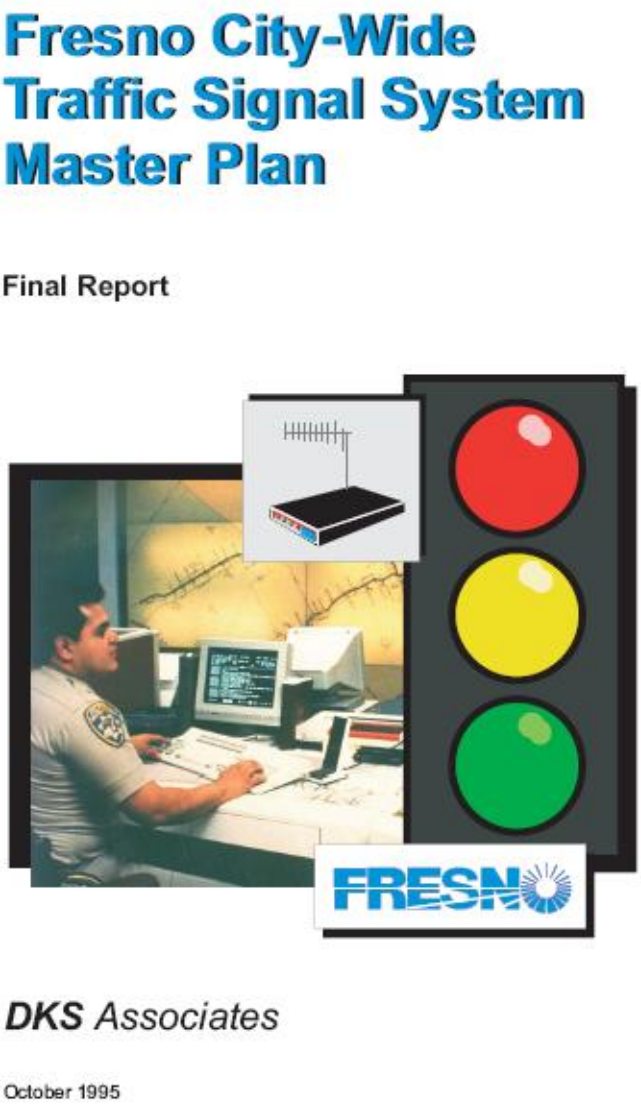
5. Institutional Structure and Suggested Policies Program Area

In addition to the identified ITS projects, the Fresno County ITS Strategic Deployment Plan defined a potential institutional structure and supporting policies to help facilitate deployment of ITS strategies. The identified supporting policies include:

- Cooperate to program, deploy, and operate common ITS resources and systems;
- Incorporate or allow for communications infrastructure during the development of regionally significant transportation infrastructure;
- Adopt the regional, statewide, and national architecture to support the exchange of transportation related information and integration of systems between agencies;
- Utilize regional standards for communications, transportation management and/or information, and emergency services systems;
- Seek institutional arrangements where the joint deployment of ITS promotes economies of scale, avoids duplication of effort, and/or promotes regional integration of systems;
- Funding preference should be given to projects that are a cooperative effort between two or more agencies, all other factors being equal;
- Cooperate at local and regional levels to establish common and/or seamless transportation operations across jurisdictional boundaries;
- Agencies should always retain the ability to “take control” of their respective components of integrated system(s);
- Incorporate ITS elements as part of major transportation projects during the project development process;
- Deploy ITS to enhance the accuracy and extent of transportation user information provided to the traveling public.

City's Intelligent Transportation Systems Master Plan

The Intelligent Transportation Systems Mission for City of Fresno Public Works Department is to implement a Advanced Transportation Management System that will improve safety, mobility, efficiency, transportation productivity, and qualify of life and environment in the greater Fresno metropolitan area in a manner consistence with the Fresno City-Wide Traffic Signal Control System Master Plan, 1995; Fresno County ITS Strategic Deployment Plan, 1999; San Joaquin Valley Regional ITS Plan, 2001; and Regional Transportation Plan, 2007.



In 1995, the City of Fresno Public Works Department embarked on a goal to build a Traffic Operations Center and a city wide fiber optic network that would interconnect City of Fresno, City of Clovis, County, Council of Governments, and Caltrans District 6, providing the foundation for an Intelligent Transportation System Network and Advanced Traffic Management System (ATMS). The ATMS would connect the Traffic Operations Center to a fiber network, connecting key arterials and expressways for an efficient citywide traffic coordination system. The network of controllers, cameras and radar systems will relay "real time" traffic or accident information to Transportation, Transit, Fire, and Emergency Services will assess the incident and dispatch the appropriate services.

The timely completion of ITS Phases 1, 2 and 3 demonstrates the City's commitment to San Joaquin Valley's and Fresno County's Intelligent Transportation System Vision, and the City's Intelligent Transportation Mission. The City of Fresno's ITS Phases 1 and 2 constructed the Traffic Operations Center and 55 miles of transportation infrastructure. The ITS Phase 3 project recently completed constructed the City's Advanced Transportation Management System, interconnecting approximately 65 traffic signals for key corridors of Blackstone, Herndon, Willow, Chestnut, Kings Canyon, and parts of Downtown Fresno.

Corridor Management Strategy

One of the most fundamental responsibilities of the City is to ensure provision of adequate public facilities that will support the existing city as well as projected growth. Public facilities and services impacted by population growth and urban development include circulation and public transportation. Continued urban development within the urban boundary established by the 1983 Joint Resolution on Metropolitan Planning and the expanded urban boundary of the 2025 Fresno General Plan will necessitate new expanded facilities and increased service capacities.

> *"Coordinate land uses and circulation systems to promote a viable and integrated multi-modal transportation network" (2025 Fresno General Plan, Goal No 6, 2002).*

The City's 2025 General Plan provides the Transportation/Streets and Highways Objectives as follows: 1) Provide a complete and continuous streets and highway systems throughout the Fresno Metropolitan area that is safe for vehicle users, bicyclists, and pedestrians and that provides efficient movement of people and goods consistent with the goals and objectives of this plan. 2) Maintain a coordinated land use and circulation system that conforms to the planned growth, minimizes traffic conflicts, reduces impacts on adjacent land uses, and preserves the integrity of the existing neighborhoods *(City of Fresno, 2025 Fresno General Plan, 2002: Facilities Element).*

The City's ITS Program supports the City's 2025 General Plan transportation objectives through the application of technologies that focus on addressing transportation problems by improving the existing transportation infrastructure. The ITS Program includes more immediately recognizable benefits such as traffic signal synchronization which improves the efficiency of an arterial up to 18%. ITS Program's continued funding will produce countless long term benefits some of which include traffic responsive synchronization, preemption, changeable message signs, weather stations when managed through the City's state-of-the-art Traffic Operation Center that will improve efficiency, safety, operations, energy conservation, and effective capacity of the key arterial while reducing emissions.

The Intelligent Transportation Systems corridor management strategy supports the City's 2025 General Plan Circulation Element, Goals, and Policies; the 2007 Regional Transportations Plan Highways, Streets, and Roads needs assessment Needs Assessment; the SJV Regional Plan Priority Projects; the Fresno County ITS Deployment Strategy; and achieved through City of Fresno Transportation Staffs' traffic assessment through engineering judgment and/or Synchro Traffic Models to determine the priority corridors identified for ITS infrastructure deployment.

Capital Program Strategy

The City's ITS Capital Program Strategy consists of 1) the phased deployment of ITS corridors with air quality and transportation grants, 2) the phased deployment of City wide ITS intersection improvements through developer Traffic Signal Mitigation Impact Fee Program as the General Plan is built out, and 3) the deployment of the City's and region's ITS infrastructure through mutually beneficial partnerships for shared conduit and fiber.

Capital Program Funding

The ITS Capital Phases 1 and 2 constructed the Traffic Operations Center and 55 miles of transportation infrastructure. Phase 3 project completed building the Advanced Transportation Management System, interconnecting approximately 65 traffic signals for key arterials of Blackstone, Herndon, Willow, Chestnut, Kings Canyon and parts of Downtown Fresno.

- Phase 1 1999 - 2001 constructed Blackstone Ave corridor (approximately $5 million).
- Phase 2 2001 - 2003 constructed Traffic Operations Center; conduit & infrastructure built for Herndon, Willow, Chestnut, Kings Canyon & parts of Downtown Fresno (approximately $6 million).
- Phase 3 2006 - 2007 constructed the fiber optic loop (approximately $4 million).

The Public Works Department's ITS Capital Program's future is promising with an additional $18 million grant funding for City wide Intelligent Transportation Systems deployment. The ITS Program has secured grants to construct Intelligent Transportation Systems and synchronize 12 additional ITS corridors (266 signals), synchronizing two thirds (331 of 500) of City's traffic signals by 2015. (Corridor details and map are provided on pages 16 - 17).

In 2006, Congestion Mitigation and Air Quality Program awarded the Public Works Department ITS Program $4.2 million for Intelligent Transportation Systems deployment on Shaw Ave from SR 99 to Highway 41.

In 2008, Proposition 1B Traffic Light Synchronization Program Grant awarded $2.1 million and CMAQ Lifeline allocated 1 million as a required match, totaling $3.1 million for ITS deployment on Shaw Ave from Highway 41 to Highway 168. The Shaw Ave corridor is one of the busiest commercial corridors intersecting SR 99, Highway 41 and 168, Fresno State, Save Mart Center, Fashion Fair Mall, Sierra Vista Mall, among many movie theaters and shopping centers.

In 2008, Proposition 1B Traffic Light Synchronization Program Grant awarded for $2.1 million for ITS deployment on Clovis Ave. Also in 2008, Congestion Mitigation and Air Quality Program Grants awarded $1 million for ITS deployment on Clovis Ave. Clovis Avenue is a key corridor connecting City of Fresno, County of Fresno, City of Clovis, the Yosemite International Airport, Highway 180, and SR 99. The Clovis Avenue corridor has emerged as the primary North-South corridor for the SE residents of Fresno-Clovis Metropolitan region.

In 2008, Congestion Mitigation and Air Quality Program Grants awarded the ITS Program with $1.4 million for ITS deployment on Willow Ave. Similarly, the Congestion Mitigation and Air Quality Program Grants awarded $220,000 for wireless ITS deployment along Fresno Street.

In 2009, Congestion Mitigation and Air Quality Program Grants awarded the ITS Program with $5.8 million for Wireless Intelligent Transportation Systems deployment on Nees Ave, Bullard Ave, Ashlan Ave, Shields Ave, McKinley Ave, Tulare Street, West Ave, and First Street. Also, Congestion Mitigation and Air Quality Program Lifeline allocated $1 million to construct Fiber Intelligent Transportation System along Palm and Friant corridors.

Traffic Signal Impact Fees

Traffic Signal Mitigation Impact Fee Program will provide $23 million of developer fees or developer constructed ITS facilities as the City's General Plan is built out (*City of Fresno, Bill B-48, Ordinance 2007-50, 2007:* Article 4.11). All traffic signal projects include Intelligent Transportation Systems per City ITS Standards. The ITS Standards and Specifications were published in 2008 after 2 years of extensive research and development *(City of Fresno, ITS Standards and Specification).*

Regional Partnerships

The ITS Program fosters local partnerships through mutually beneficial and shared resources. The ITS Program worked with Clovis Unified School District to provide fiber connectivity between CUSD Office and Schools (2003) and has recently negotiated an addendum to the contract expanding the agreement to provide fiber connectivity to their new State Center Community Campus on Willow. The ITS Program has partnered with Caltrans District 6, providing fiber connectivity to Highway 41 ramps through the Blackstone corridor segment of the fiber network.

ITS Program Staff are currently working with Caltrans District 6 Staff towards a mutually beneficial shared fiber network agreement throughout the City and Caltrans local fiber networks. Similar partnerships may be soon emerging while interconnectivity is being provided for Fax, Emergency Services/Fire Department, Council of Governments, and Fresno County.

Capital Program and Synchronization

When conditioned, capital, developer, or regional partnership projects will construct turnkey ITS projects for integration into the ITS Operations and Maintenance Program.

- All project design and construction will be in accordance with City of Fresno ITS Standards and Specifications and City of Fresno draft Traffic Signal Timing and Coordination Manual.

- All project design budgets will include the development of the signal coordination plans for the initial timing plans and the deployment of the coordination at the completion of construction. The traffic signal timing work will not be deferred to the operation and maintenance budget.

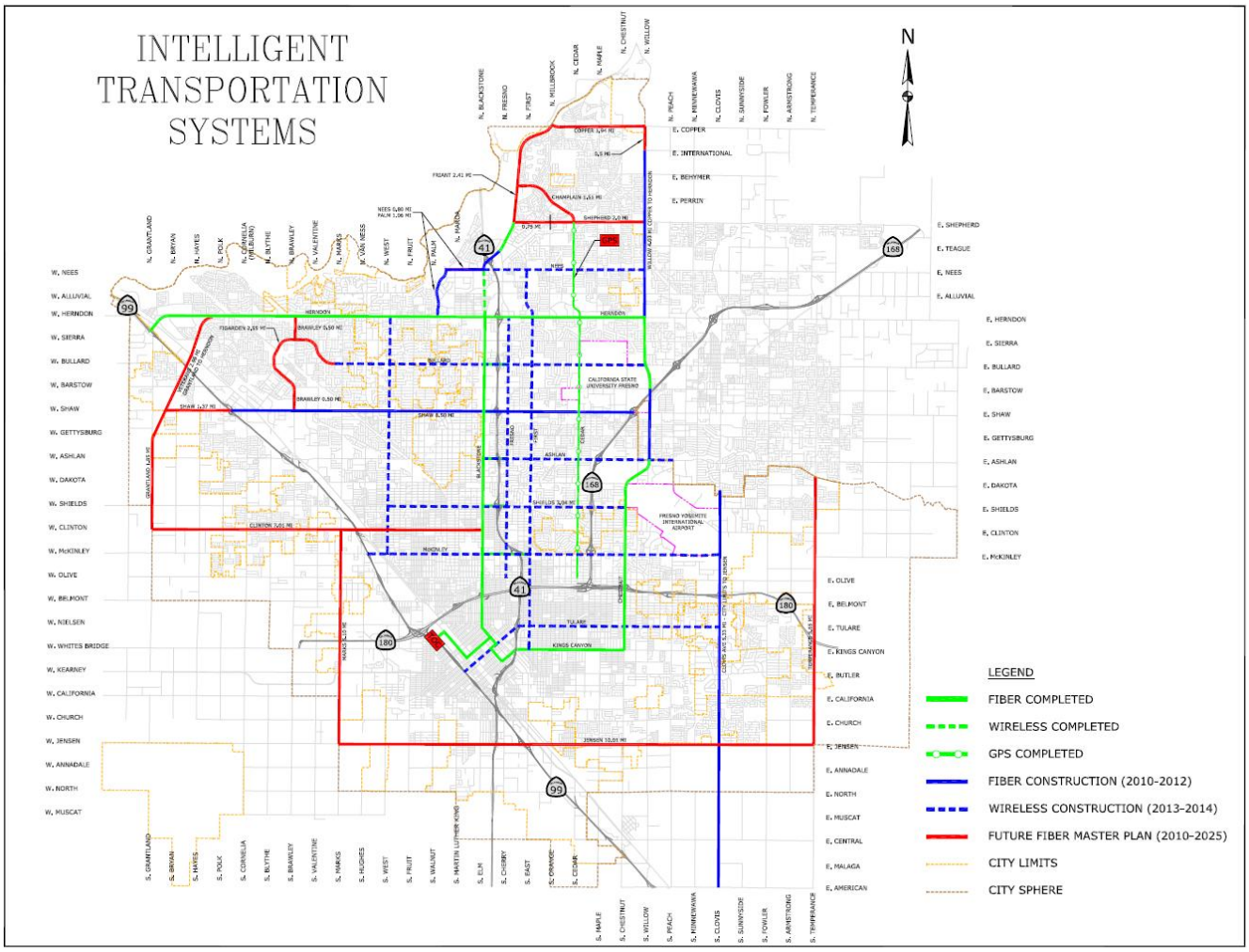
- All project construction budgets will include all equipment, installation and testing. The installation of cameras, fiber, radar or controllers will not be deferred to the operation and maintenance budget.

- Capital Program and Synchronization anticipated schedule is as follows:

Capital Program Phase and Schedule				
ITS Corridors	**Corridor Limits**	**Capital Program Phase**	**Capital Program Schedule**	**Traffic Signal Lights**
Blackstone Ave Fiber	McKinley to Herndon	Completed	2006	17
Herndon Ave Fiber	Willow to Golden State	Completed	2007	23
Kings Canyon Road Fiber	Downtown to Chestnut	Completed	2008	13
Chestnut Ave Fiber	Kings Canyon to Ashlan	Completed	2009	9
Cedar Ave GPS Clocks	Olive to Shepherd	Completed	2009	22
Blackstone Ave Wireless	Herndon to Nees	Completed	2009	4
Friant Road Fiber	Nees – Audubon – Shepherd	Completed	2009	3
Shaw Ave Fiber	Highway 41 to 168	PSE – Design	FY 2010	9
Clovis Ave Fiber	Dakota to American	PSE – Design Construct	FY 2010 FY 2011	15
Shaw Ave Fiber	Highway 41 to SR 99	PSE – Design Construct	FY 2010 FY 2011	14
Willow Ave Fiber	Ashlan to International	PSE – Design	FY 2011	16
Fresno Street Wireless	Olive to Herndon	PSE – Design	FY 2011	16
Shields Ave Wireless	West to Chestnut	PSE – Design	FY 2011	20
Palm-Nees-Friant Fiber Corridor	Herndon to Shepherd	PSE – Design	FY 2011	10
Downtown Fresno Street	Down Town	TIP – Funded	2012-2015	7
First Street Wireless	Nees to Ventura	TIP – Funded	2012-2015	25
West Ave Wireless	Herndon to McKinley	TIP – Funded	2012-2015	12
Nees Ave Wireless	Palm to Willow	TIP – Funded	2012-2015	13
Bullard Ave Wireless	Marks to Willow	TIP – Funded	2012-2015	19
Ashlan Ave Wireless	Blackstone to Peach	TIP – Funded	2012-2015	15
McKinley Ave Wireless	SR99 to Clovis Ave	TIP – Funded	2012-2015	23
Tulare Street Wireless	Downtown C Street to Clovis Ave	TIP – Funded	2012-2015	26
ITS Master Plan	Update 1995 Master Plan	TIP – Funded	2012-2015	
Total Traffic Signals Funded				**331**

Note: TIP – Council of Fresno County Governments Federal Transportation Improvement Program.

Capital Program Map 2010 - 2015



Operations and Maintenance Strategy

In 1995, the City of Fresno Public Works Department embarked on a goal to build a Traffic Operations Center and a city wide fiber optic network that would interconnect City of Fresno, City of Clovis, County, Council of Governments, and Caltrans District 6, providing the foundation for the City's Intelligent Transportation System Program.

The completion of the City of Fresno ITS Phase 3 Project connects the Traffic Operations Center to a fiber network, connecting key arterials and expressways for an efficient citywide traffic coordination system. The total project cost for ITS Phases 1, 2 & 3 has reached approximately 15 million dollars in Federal Congestion Mitigation Air Quality (CMAQ) and Regional Surface Transportation Program (RSTP) grants awarded through Council of Governments (COG) and administered through Caltrans Local Assistance Program for Federal Highway Administration (FHWA). The City of Fresno has endorsed Administrating Agency-State Agreement for Federally Aid Projects and numerous Program Supplements which harbors specific language on administrating agency's responsibilities including the need for the operation and maintenance of the constructed ITS facilities and systems.

O & M Budget

The Public Works ITS Operations and Maintenance Budget is approximately $700,000 annually. The ITS Budget funds 7 permanent Traffic Engineering Division positions tasked with operating and maintaining the City's Advanced Transportation Management System.

O & M Service Delivery Level

The ITS Program operations and maintenance budget provides a basic level of operating service for traffic synchronization of existing ITS corridors and also provides a basic level of service for maintenance of the existing ITS facilities and systems. However, the ITS Program operations and maintenance is structured for future growth with delivery of various levels of operating and maintenance services including 1) traffic synchronization for future ITS corridors, 2) traffic responsive synchronization, and 3) special event traffic management all of which can be managed through the City's state-of-the-art Traffic Operation Center to improve efficiency, safety, operations, and effective capacity of the key arterials.

Operations Standard Level of Service

- The current ITS O&M Budget & staffing provides for a standard level of service. The City's development and growth results in changing traffic patterns and increased traffic volumes in existing ITS corridors which need updated timing plans every two years.

- The growth of the ITS system with the planned 12 additional corridors (approximately 266 additional signals) will require additional signal timing and maintenance staff to retain the standard level of service.

Operations Enhanced Level of Service

- The ITS system is capable of implementing traffic-responsive timing plans (e.g. changing from plan A to plan B when the through movement or left turn volumes drop or increase to a certain threshold rather than time-of-day plans) or special event timing plans (e.g. Shaw Ave timing plans for holiday shopping season at Fashion Fair, Fresno State football, and Save Mart Center events; or Blackstone Ave timing plan to work in conjunction with a major incident on SR-41 that diverts large volumes of freeway traffic to Blackstone Ave). This is not currently possible with existing staffing.

- The ITS system is capable of implementing special event traffic management. The system of traffic surveillance cameras and timing plans can allow Traffic Engineering staff to observe traffic flow, monitor incidents, coordinate with the Police Department and implement the appropriate changes to best serve the traveling public. This is not currently possible with existing staffing.

The ITS Program Staff will be further developing this Management Plan to a multiyear ITS Strategic Plan that incorporates ITS Standards & Specifications and current documents under development such as the Traffic Signal Timing Manual, TOC Operations Manual, Inventory Management Plan, City-Wide Fiber Maintenance Agreement, Asset Replacement Program, Regional Fiber Agreement.

Maintenance Levels of Service

The ITS O&M Budget & staffing provides for a standard level of maintenance service.

- The ITS O&M Budget provides for maintenance staff and for a replacement fund for the replacement of damaged or non-serviceable equipment. The O&M Budget does not provide for a maintenance fund for the preventative replacement of equipment at end of warranty period.

- The growth of the ITS system with the planned 12 additional corridors (266 additional signals) will require additional equipment replacement funds to retain a standard level of service.

ITS Staff conducted an assessment to determine the overall replacement fund and maintenance fund for constructed ITS infrastructure and planned ITS capital projects. The standard level of service for replacement fund requirement (for the replacement of damaged or non-serviceable equipment) is approximately $75,000 annually or 0.5% of overall asset construction costs. The assessment indicates the maintenance fund requirement (for the replacement of equipment at end of warranty period) is approximately $175,000 annually or 1.2% of overall asset construction costs ($15 million).

Organization Strategy

The ITS Program has established a Management Advisory Group, an O&M Advisory Group, and a Technical Advisory Group to guide the procedures, policies, and standards development process.

The Management Advisory Group consists of the City Engineer, City Traffic Engineer Manager, Design Services Manager, Street Maintenance Manager, ISD Manager, Budget Manager, and Program Coordinator who meet semi-annually to guide the policy development process.

The O&M Advisory Group consist of the Chief Engineering Technician, Supervising Engineering Technician, Traffic Signal Shop Supervisor, and Program Coordinator who meet quarterly 1) to develop ITS project deliverables, 2) to coordinate inter-group ITS service delivery, 3) to explore industry best practices, develop procedures, and recommend policy to the ITS Advisory Group.

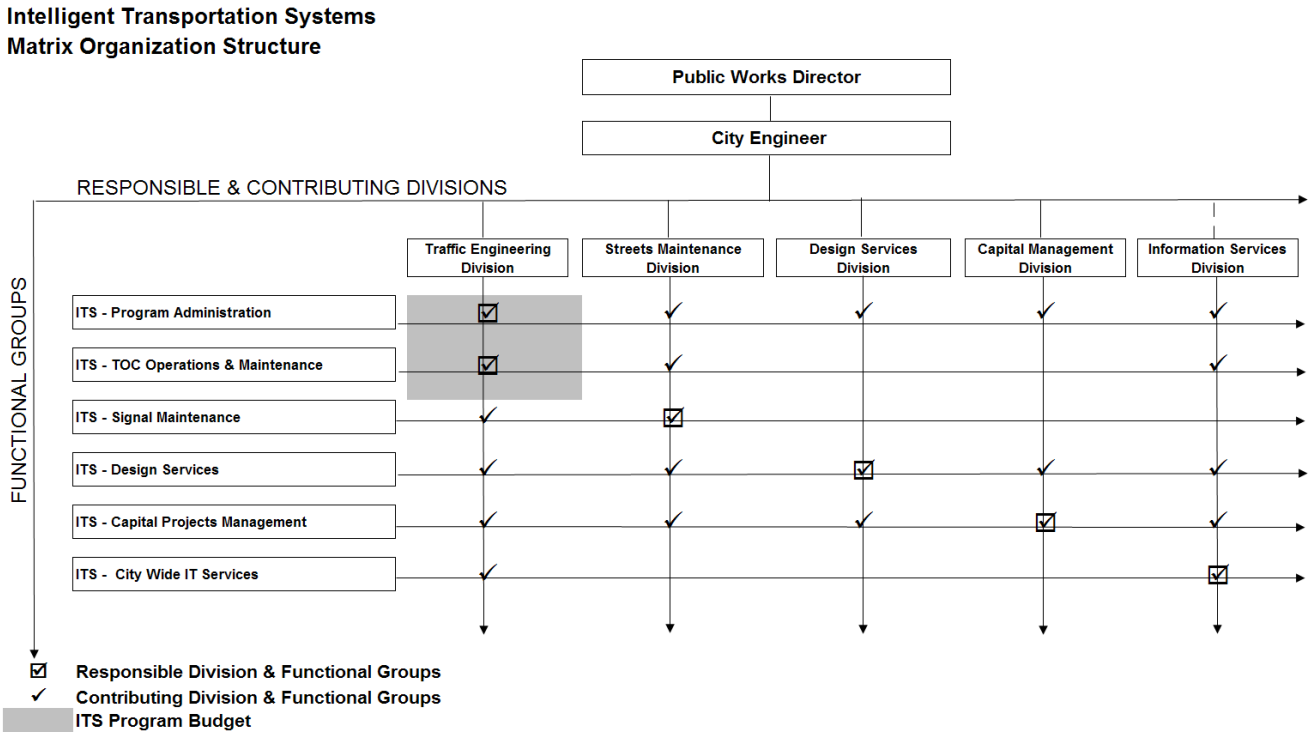
The Technical Advisory Group consists of the City Traffic Engineer & Traffic Engineering Assistant Manager, Design Engineer & Supervisor, Traffic Signal Light Supervisor, TOC Chief, ISD Manager & Supervisor, and ITS Program Coordinator who meet quarterly to guide the standards development process.

Program Positions

The ITS Operations and Maintenance Program has 7 dedicated ITS positions in Traffic Engineering. The 7 dedicated positions include a Chief Engineering Technician, 2 Supervising Technicians, 1 Electrician, 1 Engineering Technician, 1 Engineering Aide, and 1 Project Manager.

ITS Operations, Maintenance, and Capital Program organizational support is provided through a cross departmental/divisional matrix structure allowing for management involvement, oversight and technical support.

Division & Functional Group Responsibility Matrix



Responsible and Contributing Divisions:

Intelligent Transportation Systems responsible and contributing divisions include Capital Services Division, Design Services Division, Traffic Engineering Division, Street Division, and Information Services Division. ITS project development and deployment is an amalgamation of design of infrastructure and technology, project management, construction and deployment of technology, traffic engineering & synchronization, traffic signal and information technology maintenance. Successful ITS project development and deployment involves close coordination multiple disciplines, divisions, and departments.

- ITS Program Administration and Operations & Maintenance is under the oversight of the Public Works Director, City Engineer, and/or City Traffic Engineer.
- Responsible and Contributing Division's ITS roles and responsibilities are under the oversight of the Public Works Director and/or City Engineer.
- " ☑ " Denotes Responsible Divisions and " ✓ " denotes Contributing Divisions.
- Responsible Divisions may elect to delegate to a Contributing Divisions if the expertise is housed within the Contributing Division and with the consent of the Public Works Director, City Engineer, or City Traffic Engineer.
- Responsible and Contributing Divisions' contribution is essential for development of the ITS Program, Projects, and Policies (ITS Standards & Specifications; Management Plan; TOC Operation Manual; City-wide Fiber Maintenance & Use Agreements; Regional Fiber Agreements).

Functional Groups:

Intelligent Transportation Systems Operations and Maintenance requires expertise crossing multiple disciplines and divisions.

- Operations & Maintenance management is under the oversight of the City Traffic Engineer or designee.
- Functional Groups' ITS roles and responsibilities are under the oversight of the City Engineer or designee.
- Functional Groups' administrative responsibilities are under the oversight of their respective Division Managers & Supervisors.
- Functional Group Supervisors may be required to prepare project plans including scope, cost, schedule, and performance.
- Functional Group Supervisors are responsible for monthly project progress updates.
- Functional Groups or Staff with specific ITS expertise may be tasked to provide services or support for any Functional Groups including Design and Capital Management. Staff resources, priorities, and schedules will be determined by City Traffic Engineer or designee.

Management Organization Structure

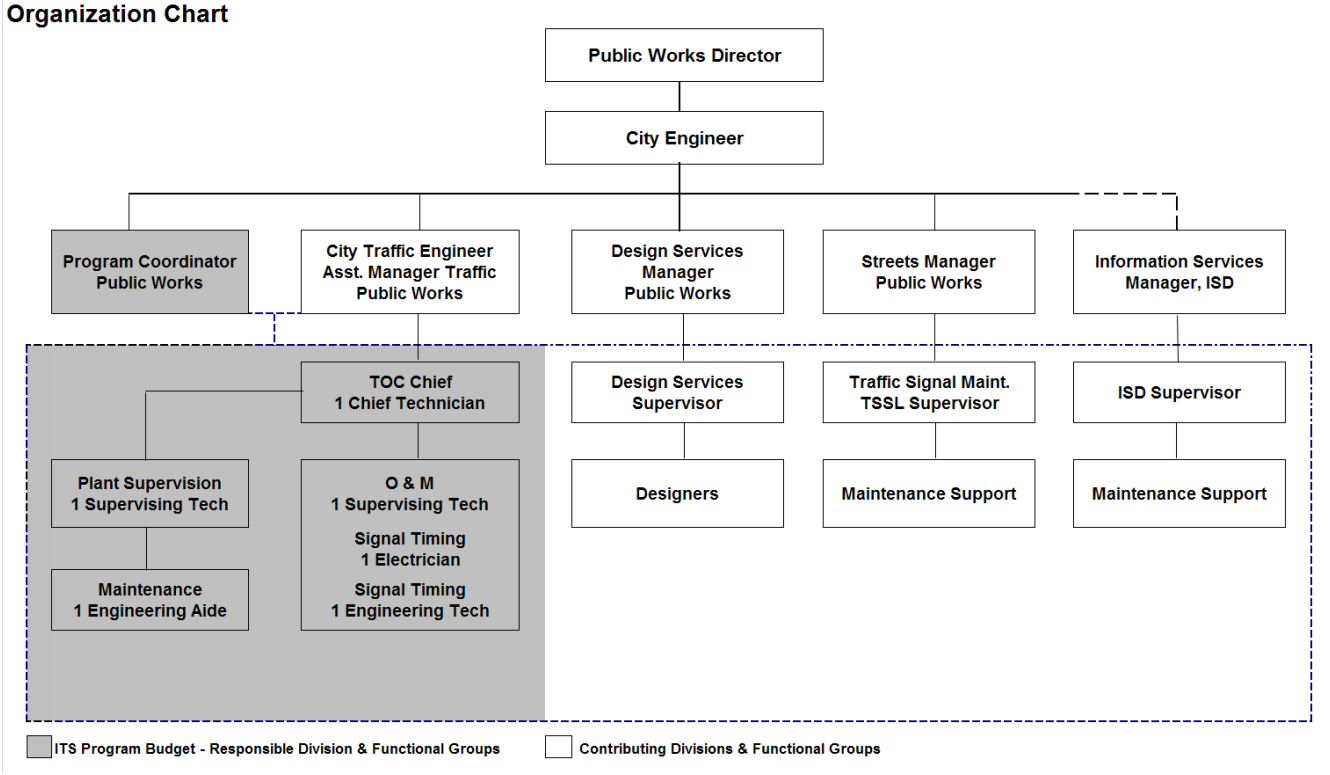
The Traffic Engineering ITS budgeted staff, highlighted in grey, are primarily responsible for traffic signal timing & corridor synchronization, information technology maintenance and overall ITS Program coordination, including budget and grant administration, standards development, project design and management and field maintenance.

The ITS field maintenance is provided by the Street Division, Traffic Signal and Street Light (TSSL) Group. The ITS Management Plan Roles and Responsibilities Table identifies core TSSL responsibilities; and TOC Operating Procedure, Traffic Signal Timing Card for Maintenance and Archiving Policy, January 2009, provides the details.

The ITS capital project design is managed by Design Services Division in collaboration with Traffic Engineering Division, Street Maintenance Division, and Information Services Department due to the complex interdisciplinary requirements of ITS capital projects.

The ITS information technology management is provided Public Works Department; and in part, management is delegated to the Information Services Department through various mutually beneficial Memorandum of Understandings (MOUs). The Traffic Division's oversight is for the construction, maintenance, and beneficial use of the technology for Transportation. The Information Services Department MOU defines the responsibilities for the beneficial use of the technology for inter-departmental (Emergency Services, Fire, PD, FAX), inter-agency (Council of Fresno County Governments, Fresno County, City of Clovis) and regional stakeholders.

Intelligent Transportation Systems
Organization Chart



ITS Positions - Roles & Responsibilities

Program Coordination – *Project Manager:*

The ITS Program coordinator is responsible for the coordination of the City's Intelligent Transportation System Operations & Maintenance, Standards, and Capital Programs, and acts as the liaison to and coordinates with City Departments, Fresno County Council of Governments, Caltrans, City of Clovis, and Fresno County, Clovis Unified Schools, and Fresno Unified Schools among others to facilitate mutually beneficial deployment of a regional ITS architecture, pursue future funding opportunities, and facilitate future project phases. The Program Coordinator is directed by the City Traffic Engineer, City Engineer, and Public Works Director.

Traffic Operations Team

Chief Technician:

- Chief Engineering Technician (TOC Chief) will supervise, operate, and maintain the City's Traffic Operations Center and Advanced Traffic Management System (ATMS.Now).

- The Chief is responsible for developing, updating, improving traffic signal timing and coordination plans. This includes, but not limited to, continuously monitoring, modeling, and coordinating the City's traffic signals for optimal traffic flow or as directed by the City Traffic Engineer.

- The Chief Technician supervises the Traffic Operations Team and Plant Maintenance Team. The growth of the program or primary operations needs will determine the need for additional staff or the need for reallocation of staff within the ITS program. Please refer to Roles and Responsibilities Details for Traffic Operations (TOC) Chief responsibilities.

Supervising Engineering Technician:

- Supervising Technician is responsible for maintaining plant equipment and for various projects as directed by City Traffic Engineer, Assistant City Traffic Engineer, TOC Chief, Plant Supervisor, or designee.

Electrician:

- Signal Electrician is responsible for maintaining the programming of the traffic signal controllers including the signal timing, detection and communication parameters.

- The Signal Electrician will be responsible for the testing, deploying and maintaining the traffic signal controllers, associated hardware, and controller cabinets.

- The Signal Electrician may also be called on to aid in the installation of new and modified signal timing and participate in the Operational Reviews of the City's signalized intersections.

Engineering Technician:

- Engineering Technician is responsible for the day to day monitoring of the ATMS.Now system.

- The Operator's duties include monitoring the System for Alarms and Events, maintaining and archiving controller databases, including daily "compare" reports, downloading approved timing to ITS controllers, maintaining a daily log of all controller timing transactions, review citizen complaints using scan screens and Cameras, print traffic signal timing cards, and prepare reports.

<u>Plant Maintenance Team</u>

Supervising Engineering Technician:

The Plant Supervisor is responsible for the maintenance of all inside & outside plant equipment and for various projects as directed by City Traffic Engineer, TOC Chief, ISD Manager or designee. Please refer to Roles and Responsibilities Details for Plant Maintenance responsibilities.

Engineering Aide:

The Engineering Aide is responsible for maintaining inside & outside plant equipment as directed by the TOC Chief, Plant Supervisor or designee.

<u>Traffic Signal Maintenance</u> – *Outsourced to TSSL Field Electrician*

- TSSL Supervisor is responsible for administrative supervision and functional assignments delegation and supervision.

- TSSL Field Electrician is responsible for field installations and maintenance of high voltage equipment and equipment mounted at an elevation, requiring a bucket truck. Please refer to Roles and Responsibilities Details for all Traffic Signal Maintenance responsibilities.

- TSSL Supervisor assigns tasks or project assignments to the field electrician. TSSL Field Electrician may be tasked by City Traffic Engineer, Asst. Traffic Manager, TOC Chief, Plant Supervisor, or designee.

- Tasks may be requested through the TSSL Supervisor by work order, email, or phone call. Project requests may require scope, cost, schedule, field review and approval by City Traffic Engineer.

- TSSL Field Electrician will complete work in a reasonable time frame typical within 1 week and will complete small projects based on the scope typically within 2 weeks or unless otherwise directed by Street Maintenance Manager or City Traffic Engineer.

ITS Positions - Roles & Responsibilities Details

The ITS Roles and Responsibilities table is a compilation of best practices and is subject to revision by City Traffic Engineer or their designee.

- " ☑ " Denotes Responsible Group's span of control; " ✓ " Denotes Contributing Group's required support.

- Responsible Group may delegate tasks to Contributing Group with Management approval.

- Contributing Group may request tasks from Responsible Group with Management approval.

Roles & Responsibilities Details

Administration	**Traffic Engineering**	**Design Services**	**Capital Mgmt.**	**Street Maint.**	**Info Svcs. Dept.**
Program Administration	☑	✓	✓	✓	✓
Project Design & Standards	✓	☑	✓	✓	✓
Capital Projects Management	✓	✓	☑	✓	✓
Traffic Signal Maintenance	✓	✓	✓	☑	✓
Inter-Departmental and Inter-Agency Planning, Coordination & Communications	☑	✓	✓	✓	✓
Inter-Departmental and Inter-Agency Information Technology Management	☑	✓	✓	✓	☑
O&M - Table Below Outlines Operations and Maintenance Roles and Responsibilities as Follows:	☑				

Traffic Operations Support	**Traffic Engineering Division**	**Traffic Operations TOC**	**Plant Maintenance Outside & Inside TOC**		**Traffic Signal Maintenance TSSL**
Transportation Planning, Management & Oversight	☑	✓			✓
Traffic Operations Center Management	✓	☑	✓	✓	
ITS City Hall Conference & Operations Center Mgmt.	☑	✓			
Traffic Synchronization Planning	☑	✓			
Traffic Signal Coordination & Timing	✓	☑			✓

ATMS Management & Timing Deployment	✓	☑		✓	
Signal Timing Management Signal Timing ATMS Management (Network) Signal Timing PDF Database Management Field & TSSL Paper Copy Deployment	☑ ✓ ✓ ✓	✓ ☑ ☑ ✓			✓ ✓ ✓ ☑
All Timing Adjustments.	☑	✓			✓
Field Support & Maintenance	**Traffic Engineering Division**	**Traffic Operations TOC**	**Plant Maintenance Outside & Inside TOC**		**Traffic Signal Maintenance TSSL**
Fiber Network Planning and Design	☑	✓	✓	✓	✓
Fiber Maintenance			☑		✓
Fiber Installation (small jobs < 1000 ft)			☑		✓
Conduit Repair & Maintenance			✓		☑
Fiber Vault Maintenance			☑		✓
Hub and R2D2 Cabinet Maintenance Logical configuration of IP devices in Hub & R2D2.			☑ ✓	 ☑	✓
FDU, Switch, Media Convertor, & Splice Trays & Splice Equipment Installation and Maintenance.			☑	✓	
Camera & Radar Maintenance Camera & Radar Installation Wireless Network/Device Installation & Maintenance Logical configuration for all IP devices.			✓ ☑ ✓ ✓	✓ ✓ ✓ ☑	☑ ✓ ☑ ✓
Hybrid Cable, Fiber, Cat 5/6, Class 2/SELV wiring for Cameras, Radar, R2D2 and Hub installation (<1000ft)			☑		✓
Power (non-class 2 or non SELV) wiring installation			✓		☑
Underground Service Alerts (USA)			✓		☑
Cabinet (332/6) and controller maintenance.					☑
Controller Testing and Deployment	✓	✓	✓	✓	☑
As-builds – Overall ITS Assets	☑				
As-builds – Communications Format	✓	✓	☑	✓	✓
As-builds – Design Format	✓	✓	✓	✓	☑
As-builds – IView Format	✓	✓	✓	☑	✓
Technology Support & Maintenance	**Traffic Engineering Division**	**Traffic Operations TOC**	**Plant Maintenance Outside & Inside TOC**		**Traffic Signal Maintenance TSSL**
ATMS, GIS, GPS, and other ITS owned software		✓	✓	☑	
PCs, Laptops, Servers, Switches, Routers, Media Convertors, Wireless devices.		✓	✓	☑	
IP Device Software and Hardware Monitoring Systems for Cameras, Radars, Switches, Hub Switches, Media Converters, or other IP Devices. Logical configuration for all IP devices.		✓	✓	☑	✓
Asset Management System – Hansen Inventory Management – Inside Plant Inventory Management – Outside Plant & Yard Inventory Management – TOC, ITS Conf. & Storage Inventory Management – TSSL	☑	✓ ✓ ✓ ☑ ✓	✓ ✓ ☑ ✓	✓ ☑ ✓ ✓ ✓	✓ ✓ ☑
Traffic Web	✓	✓	✓	☑	✓

Note - Traffic Division's delegation of O&M Roles and Responsibilities is subject to revision based on the O&M needs of the ITS Program.

Goals - Key Result Areas

The Intelligent Transportation Systems Mission for City of Fresno is to implement an Advanced Transportation Management System that will improve safety, mobility, efficiency, transportation productivity, and quality of life and environment in the greater Fresno metropolitan area. Fiscal Year 2011 Program Goals for Operation & Maintenance, Standards, and Capital Programs are as follows:

Traffic Synchronization Goals – ITS Staff will synchronize the City's key expressways and arterials.

- ✓ Herndon 2009
- ✓ Blackstone (re-synchronization) 2009
- ✓ Kings Canyon 2009
- ✓ Chestnut 2009
- ✓ Cedar 2009
- Herndon (re-synchronization) 2010
- Fiber Tangent/Intersections Synchronization 2010/2011
  **Palm/Palmdon, First/Warner, etc.*

Procedure & Policy Development Goals – The standards, plans, manuals, and agreements will be developed to form the foundation for the long term ITS Program management procedures and policies.

- ✓ Standards & Specifications 2008
- ✓ Wireless Standards & Specifications 2009
- TMC Operations Manual (Final) 2010
- Fiber Maintenance Agreement 2010
- Regional Fiber Agreement 2010/2011
- ✓ ITS Management Plan Update 2010

Traffic Network Maintenance Goals – ITS Staff will complete various installations and maintenance of ITS infrastructure to assure a functional traffic network.

- ✓ Herndon fiber repaired 2009
- Radar & hubs operational 2010/2011
- Kings Canyon fiber repaired 2010/2011

I-View Goal – ITS Staff will deploy ITS as-builds in I-View. The Web based media will provide ITS infrastructure as-build drawings for all designers to optimize the use and expansion of the Traffic Network as future ITS Phases and developer projects are designed and constructed.

- Communications as-builds – ITS Staff to survey ITS Phase 1 and compile with Phase 2-3.
- Construction as-builds – ITS Staff to catalog, organize, and scan construction as-builds.
- IView – ITS Staff to integrate communications and construction as-builds to Iview (City's web based as-build management & viewing system)

**As-Build Project Plan and timeline is being developed.*

Traffic Web Goal – ITS Staff will deploy the City's Traffic Web which will be the preliminary web based media to communicate traffic conditions to the traveling public.

- ✓ Traffic Web (www.FresnoITS.com) 2009
- ✓ Traffic Map 2010

Traveler Information " 511 " – ITS Staff will be working with Fresno County COG and Caltrans District 6 to host the San Joaquin Valley 511 web site.

- 511 Web Hosting FY 2010/2011

Capital Phase 3 Closeout Goal – ITS Staff will support the successful closeout and audit of the ITS Phase 3 Project.

- ✓ Project Close-out 2009

Shaw Ave Corridor (West) – ITS Staff are contributing to the ITS capital project design for Shaw Ave from SR99 to Blackstone Ave.

- PS&E 2010
- Bid & Award 2011
- Construct ITS Corridors 2011

Clovis Ave Corridor – ITS Staff are contributing to the ITS capital project design for Clovis Ave.

- PS&E 2010
- Bid & Award 2011
- Construct ITS Corridors 2011

Shaw Ave Corridor (East) – ITS Staff are contributing to the ITS capital project design for Shaw Ave from Highway 41 to 168.

- PS&E 2010/2011

Willow Ave Corridor – ITS Staff will be contributing to the ITS capital project design for Willow Ave.

- PS&E 2011/2012

Fresno Street Corridor – ITS Staff will be contributing to the ITS capital project design for Fresno Street wireless synchronization.

- PS&E 2011

Shields Ave Corridor – ITS Staff will be contributing to the ITS capital project design for Shields Ave wireless synchronization.

- PS&E 2011

Palm-Nees-Friant Fiber Corridor – ITS Staff will be contributing to the ITS capital project design for fiber optic synchronization.

- PS&E 2011

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